DESCRIPTION *of a* STEAM ENGINE.

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STEAM is univerſally allowed to be the greateſt moving power we have, and therefore if it were rendered manageable, and adapted to the occaſions of art, it might be advantageouſly applied where water, wind, men or horſes, are now uſed.

WATER is ſeldom convenient, wind is a feeble precarious agent, and muſcular force is very expenſive, and very limited; but ſteam is free from each of theſe imperfections, and is ſuperior to all in ſtrength and duration.

IT has been already applied to work the reciprocating or lever engine, which is ſurprizingly effectual in pumping water, in beating iron, and in other operations which require diſtinct and ſucceſſive impulſes.

BUT to make ſteam anſwer the various purpoſes of mechanics, it is neceſſary that it ſhould be capable of producing a *continu-*

ous and rotative motion, which itſelf is more extenſively uſeful than any other, and from which every modification of motion can be eaſily obtained.

This machine conſiſts of three principal parts, the wheel, repreſented fig. 1, the caſe, fig. 2, and the condenſer, which is the ſame with that uſed in Mr. Watts's engine, and requires no deſcription. The wheel, fig. 1, has a broad flat edge, *a b*, which is truly circular and ſmooth; at equal diſtances on this edge are placed eight folding clacks or valves, *b c d e f g h i*; theſe are attached to the wheel by ſmall moveable joints, which are ſo contrived that when ſhut they range exactly with the ſurface of the edge of the wheel, and are capable of opening half way, but no more: For inſtance, the valve *a n m b*, has a joint at *n m*, which will permit it to open through the arch *b k l*, until it arrives at the ſituation *l m*, but no farther. Theſe joints are ſo pliant that in the revolution of the wheel the valves will fall open when they deſcend near the level of the axis; and when they aſcend above it they will ſhut, by their own gravity.

The caſe of this wheel is repreſented, fig. 2. The ſides of it are at ſuch a diſtance from each other as that the wheel will exactly fill up the aperture *a b*, and the caps *c* and *d* are ſo fitted that the edge of the wheel will come in cloſe contact with them. This caſe is ſo much deeper than the wheel, that the wheel, when fixed in it, leaves a ſemicircular vacancy, *e f g h*, below it, which is exactly filled up by the valves of the wheel when extended. *i* is the tube to admit the ſteam,

ſteam, and *k* is the pipe which leads to the condenſer and drains the machine, both which muſt be open, but in all other parts the caſe is ſteam tight. *a*, fig. 3, is a rod which ſhuts the valves as they approach it, and delivers them cloſed into the ſteam veſſel.

When the wheel is put into this caſe, and ſuſpended on its axis, fig. 3, the valves within the caſe will open and fill up the ſemicircular vacancy: When the ſteam paſſes up from the boiler through the tube it cannot eſcape unleſs through this ſemicircular vacancy, and as this is filled up by the extended valves it muſt force them forward in its paſſage to the condenſer, and conſequently turn the wheel round. The condenſer is worked by a crank in the axis, and a rod *b c* extending from it; this cauſes a conſtant vacuum in that part of the ſemicircular vacancy which lies between the cap *d* and the valve *e f*, on which the ſteam preſſes; by theſe means a power is added to the elaſticity of the ſteam equal to the preſſure of the atmoſphere, ſo that when the force of the ſteam is only equal to the preſſure of the atmoſphere, and the valves are ſix inches ſquare, the wheel will be forced round by a power equal to $531\frac{1}{4}$ lb. ſuſpended at its circumference.

After each valve has performed this operation, another ſucceeds it in the like circumſtances, and thus the wheel is turned round uninterruptedly by a cheap and ſimple contrivance.

A working model of this engine, without the condenſer, was exhibited to ſeveral members of the Royal Iriſh Academy.

Fig 1

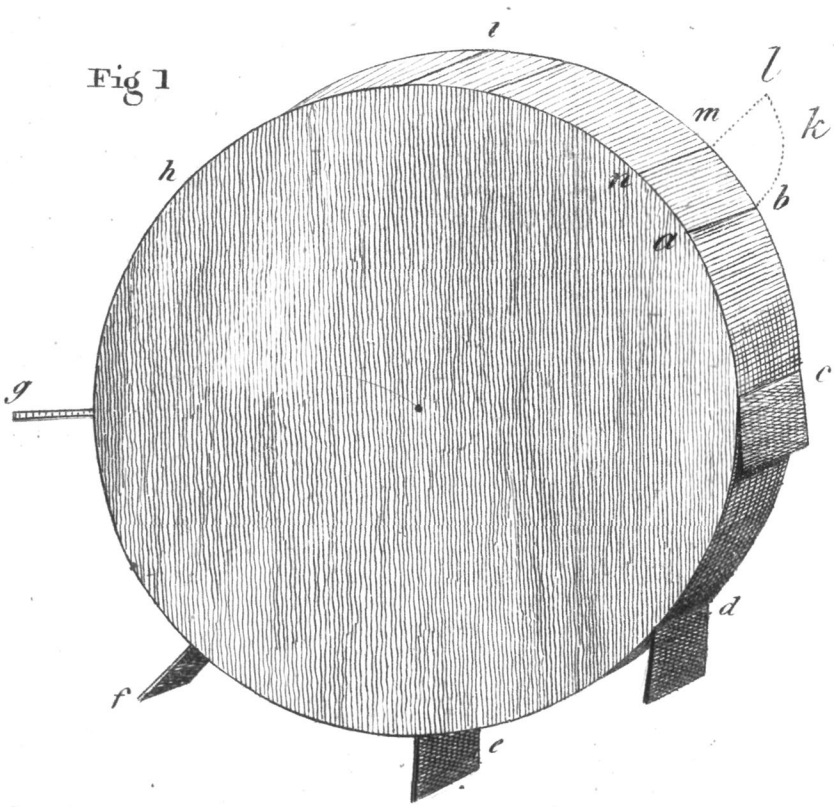


Fig 3

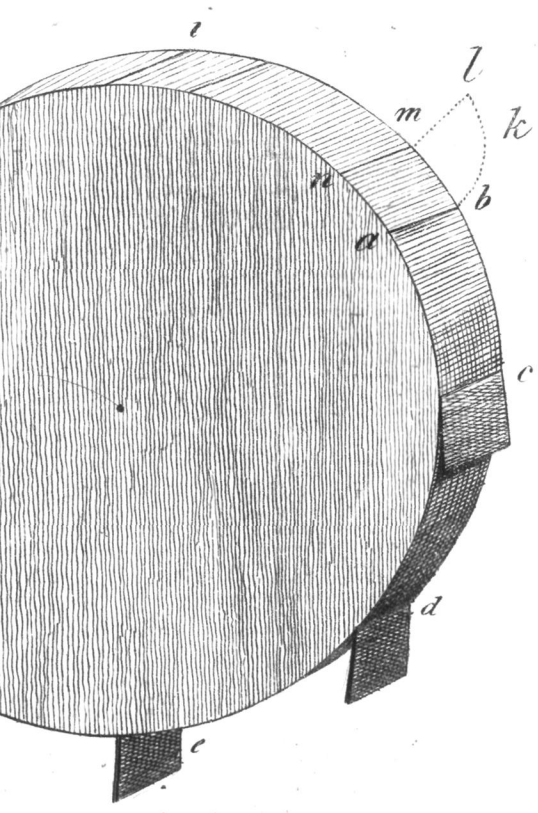


Fig 3

Fig 2

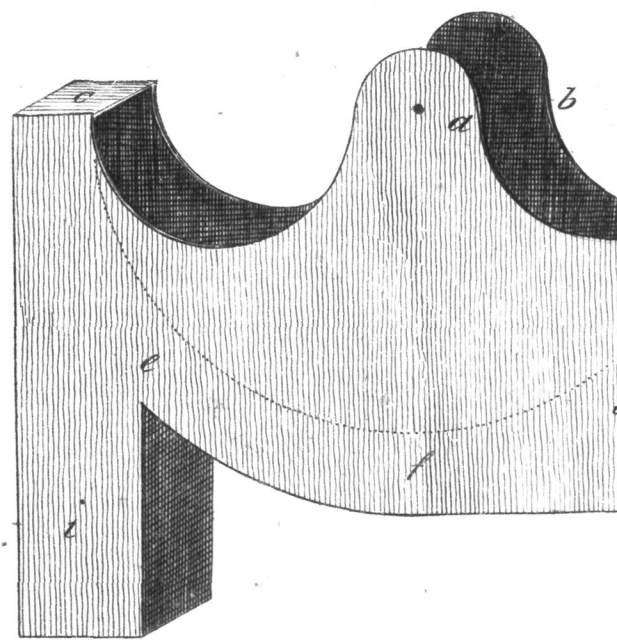


Fig 2

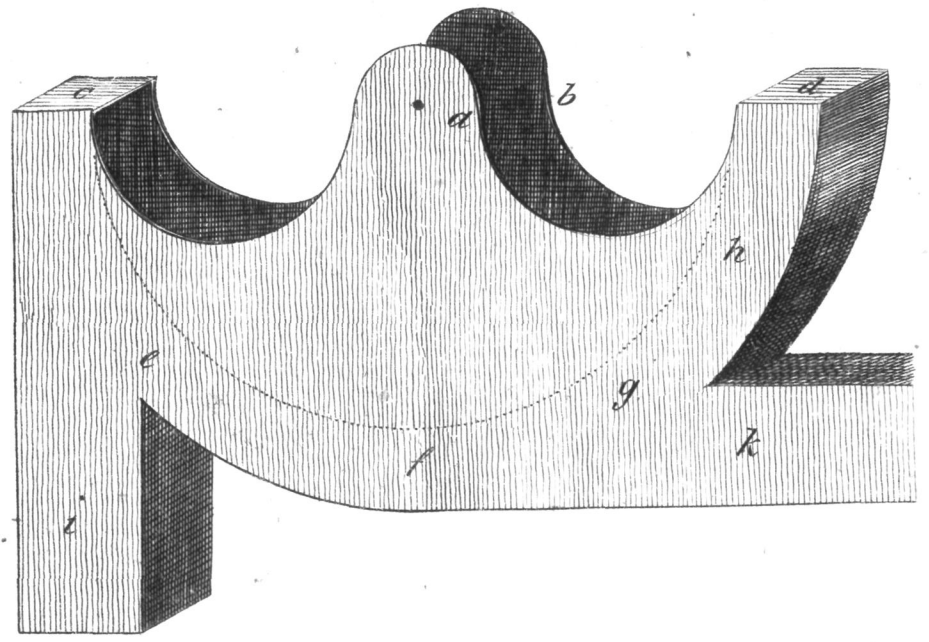


Fig 1

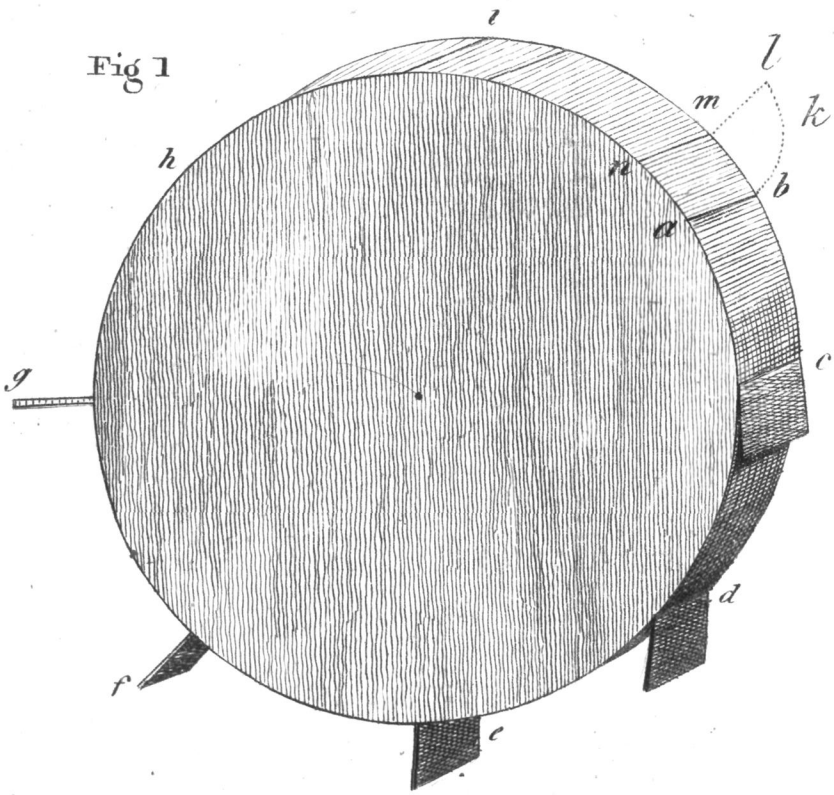
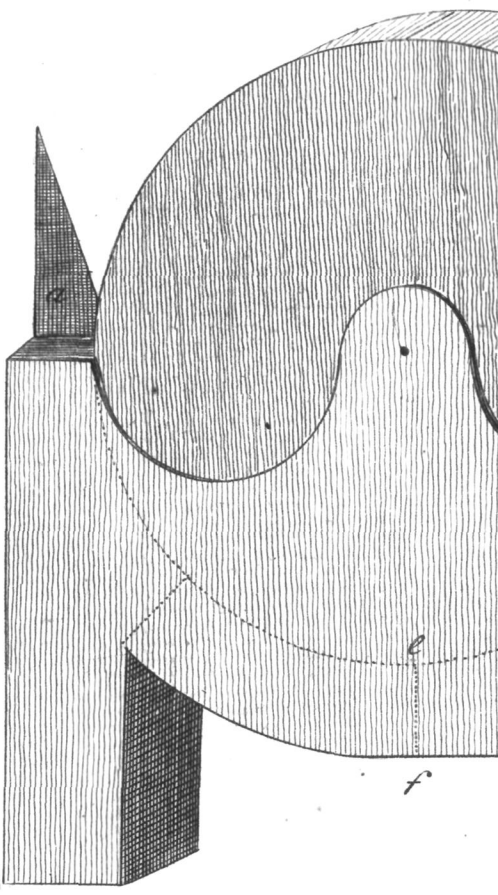


Fig 3



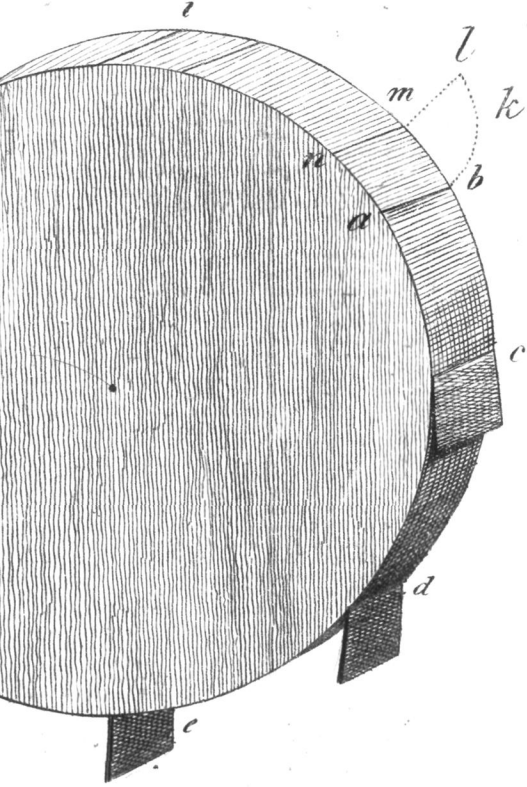
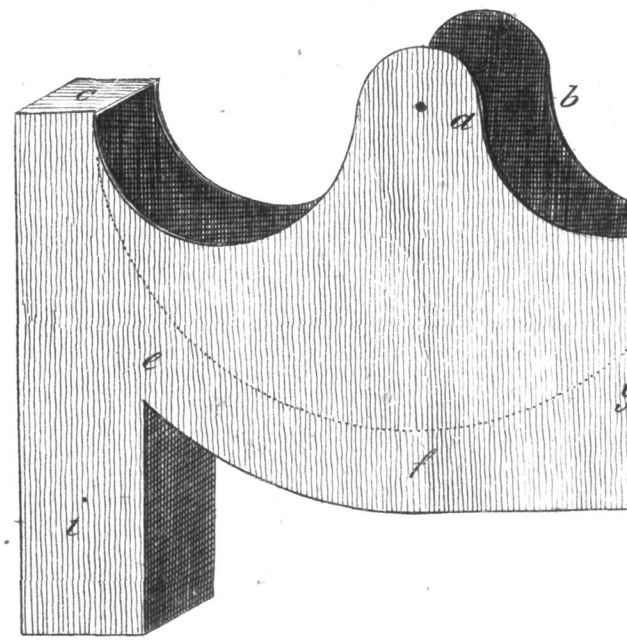


Fig 2



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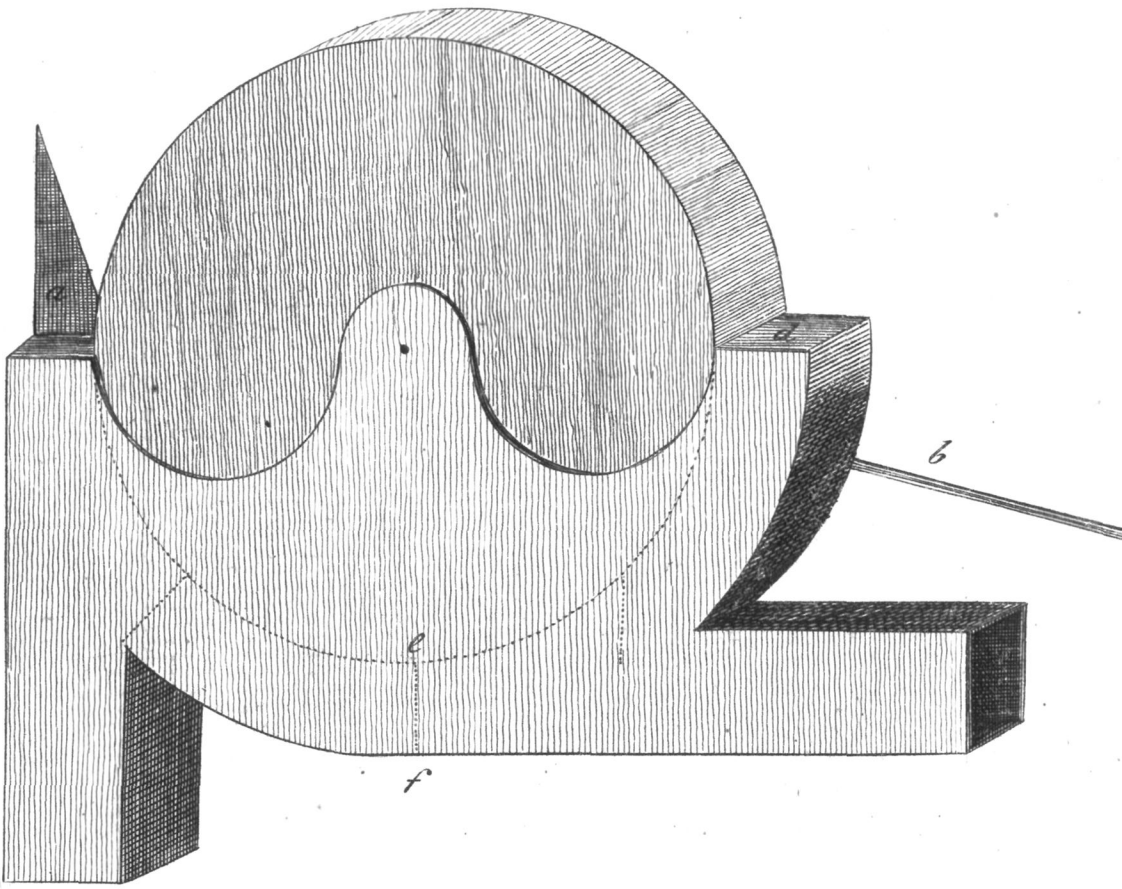
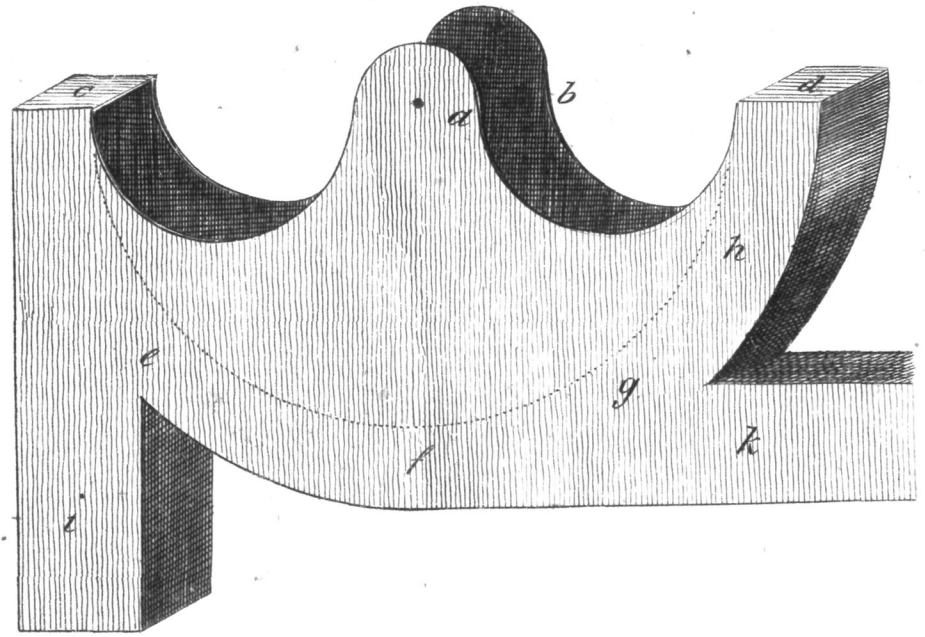
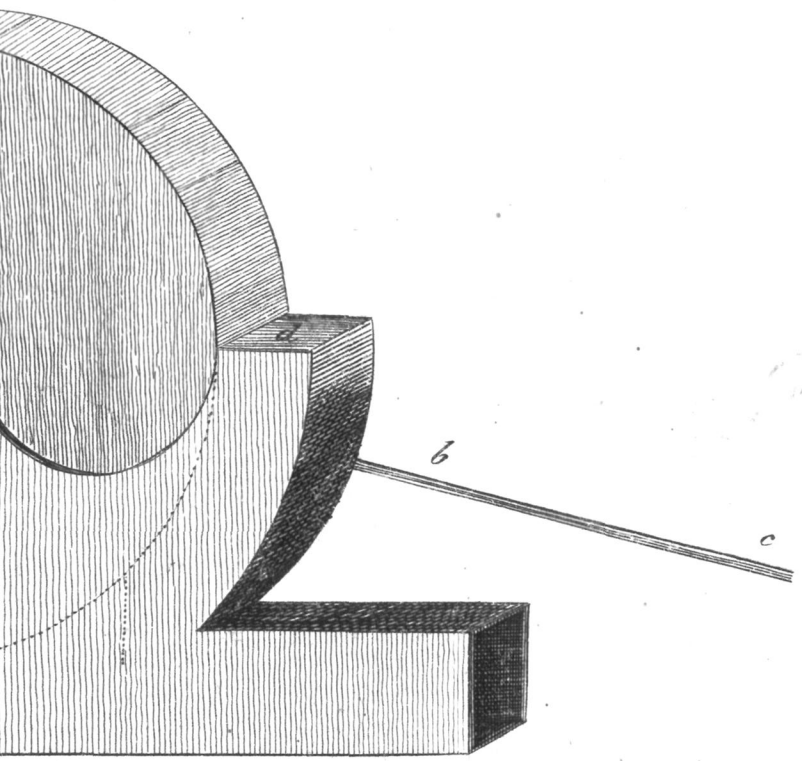
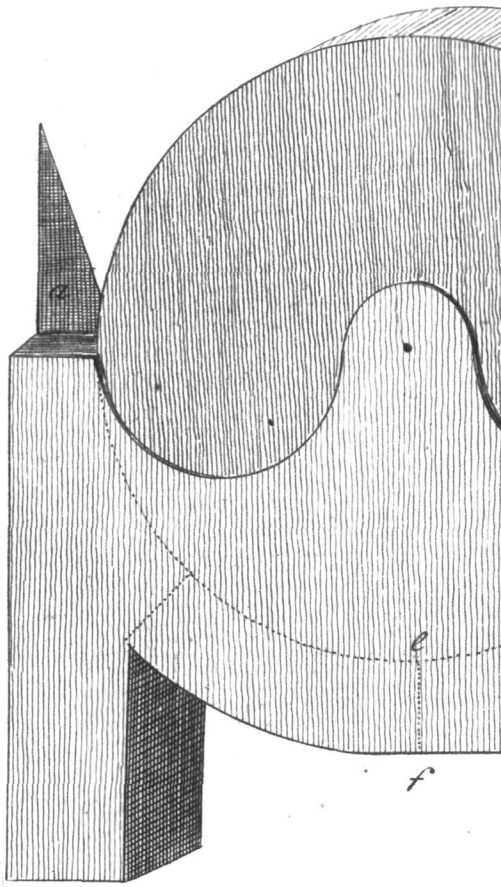


Fig 2



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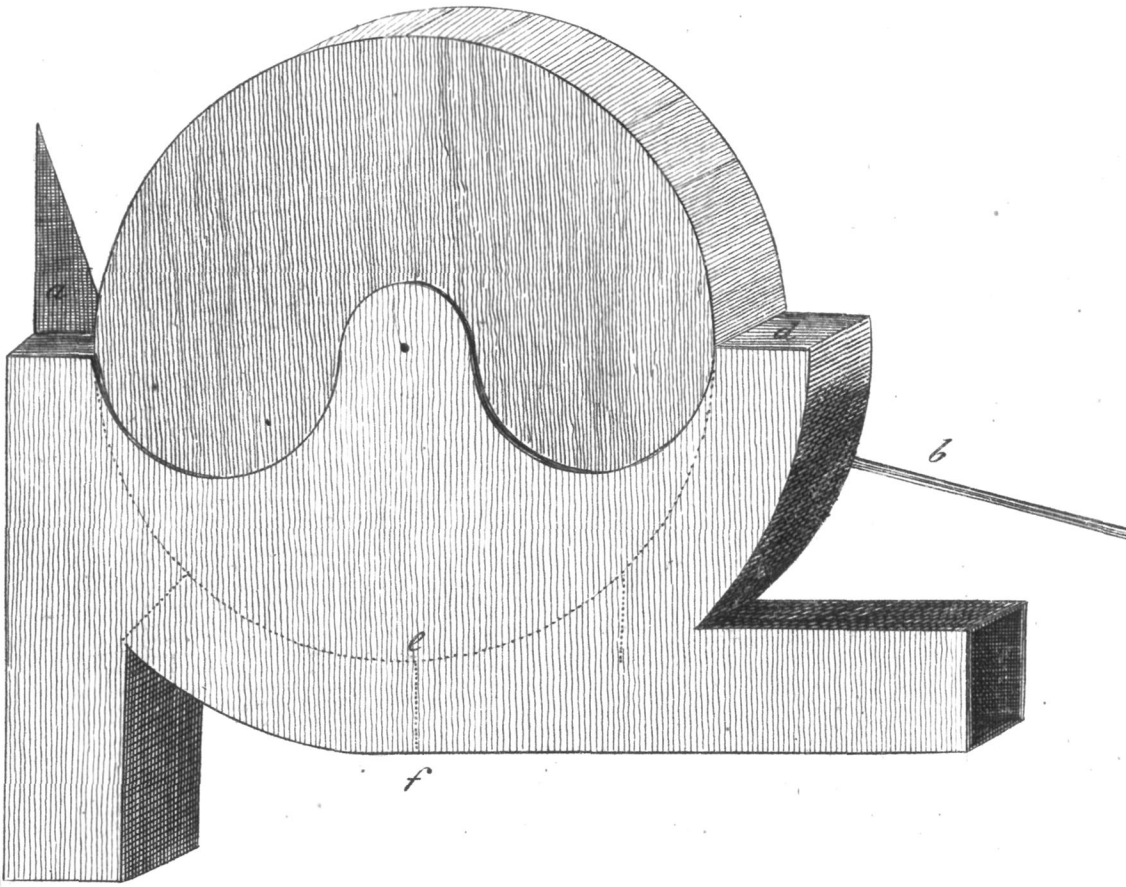
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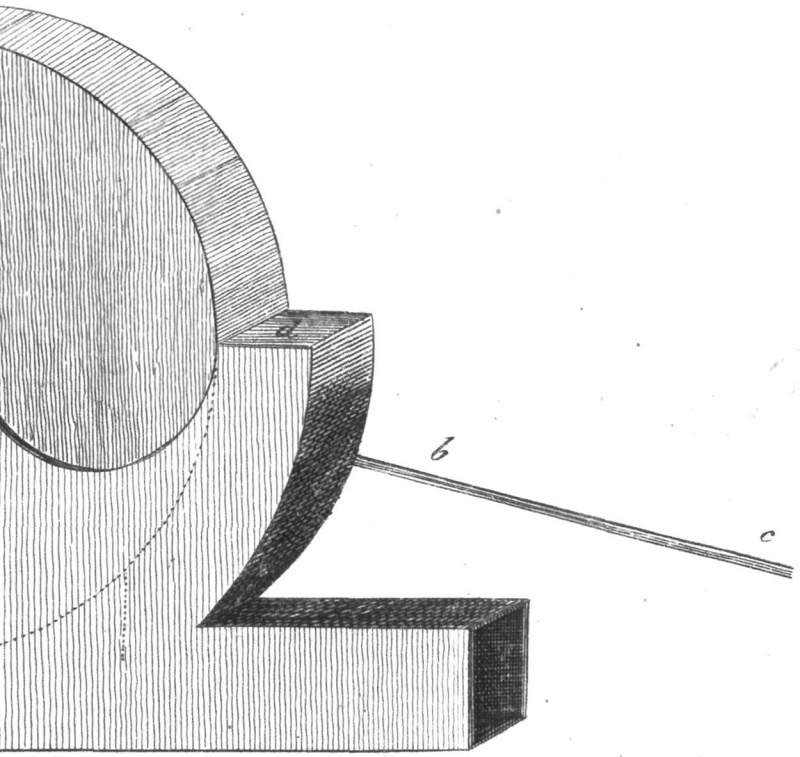

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